II.

Contributions to the Bryology and Hepaticology of North America.

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PART I.

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1. PHYLLOGONIUM NORVEGICUM, *Brid. Bryol. Univ.* 2, *p.* 674. — *Musc. Alleghan. n.* 188.

It may be doubted if this rare moss and the tropical Pterigynandrum fulgens, *Hedw.*, the type of Phyllogonium, *Brid.*, are referable to the same genus. A striking dissimilarity in habit, mode of growth, and in the position of the female flowers (which are terminal in the one, but lateral in the other), as well as the structure and reticulation of the leaf, all indicate their separation generically. The genus of our moss must remain uncertain until the discovery of its fruit, which we may now expect, since a second locality has been found, in Ohio, producing both male and female plants abundantly. The notice of this moss in the *Bryologia Universa* is evidently founded on infertile plants alone, collected in Norway, the original locality. Our Ohio specimens furnish the following additional particulars.

Caules plerumque simplices, rarissime e medio vel e summitate innovantes. Folia, illis caulium sterilium exceptis, versus apicem

caulis sensim majora; floralia 4–6, erecto-patentia, longissime acuminata, acumine diaphano flexuoso subserrulato. Flores dicœci, in caule primario vel in innovationibus e summitate progredientibus terminales: uterque flos diphyllus; archegonia 8–12 stylo longissimo instructa, stigmate magno dilatato; antheridia 10–14, elongato-fusiformia, brevissime stipitata; paraphyses haud numerosæ, tenerrimæ, genitalibus utriusque sexus immixtæ, atque in foliorum superiorum gremio per paria nidulantes. Folia perichætialia et perigonialia floralibus similia, sed paulo majora.

It grows in large patches, pendent from the perpendicular faces of sandstone rocks, in moist, shady places, six or eight miles south of Lancaster, Ohio.

TAB. I. — *Fig.* 1. Plants of the natural size. *Fig.* 2. The same, magnified. *Figs.* 3, 4. Apices of cauline leaves. *Figs.* 5, 13, 14. Transverse sections of the leaf. *Fig.* 6. Cauline leaf. *Fig.* 7. Perichætial leaf. *Fig.* 8. Archegonia and paraphyses. *Fig.* 9. Perichætial leaves inclosing archegonia. *Fig.* 10. Antheridia and paraphyses. *Fig.* 11. Perigonial leaves inclosing antheridia. *Fig.* 12. Part of the stem. Magnified.

2. FISSIDENS MINUTULUS, *Sulliv. Musc. Alleghan. n.* 183.

Planta e perpusillis gentis, vitam annuam degens. Caules simplices, assurgentes, circiter sesquilineales, basi radiculosæ, dense gregariæ, sed nunquam inter se radiculis intertextæ. Folia erecto-patentia, 4–8-juga; inferiora minuta, remota, subsquamiformia; superiora in ascendendo magis magisque majora, oblique lineari-lanceolata, acuta, fere ad medium usque conduplicata; lamina apiciali subrepanda plus minus limbata; limbo haud incrassato e cellulis elongato-fusiformibus diaphanis conflato; costa pellucida, in apice evanescente percursa, rotundato-hexagone areolata. Flores dicœci,

terminales. Folia perigonialia 2, basi ventricoso-vaginantia, parte superiore conduplicaturæ eroso-truncata, cæterum caulinis similia; antheridia 3–4, filamento brevissimo suffulta, paraphysibus nullis: perichætialia 2, caulinis superioribus conformia sed longiora. Capsula erecta, symmetrica, ovalis, inferne attenuata, siccitate sub ore dilatato constricta: pedicellus 1 lineam longus, e basi geniculata flexuoso-ascendens, siccus sinistrorsum tortus: peristomii dentes erecto-incurvati, rubelli, apice ultra medium fissi, dense articulati, cruribus inæqualibus subulatis granuloso-scabris: operculum conico-rostratum; rostro recto, aut vix curvato, dimidiam capsulæ partem longitudine æquante: calyptra solum operculum obtegens, conico-subulata, uno latere profunde fissa: sporæ majusculæ diametro æquantes dentis basi dimidiam latitudinem.

This species grows on stones in the bed of desiccated rivulets, in shaded places, near Columbus, Ohio; it fruits in July and August.

Besides other marks of less importance, the diœcity of this moss readily distinguishes it from F. incurvus, *Br. & Sch.*, small forms of which it much resembles. The character in the foregoing description, drawn from the relative length of the diameter of a spore and the breadth of a tooth of the peristome near the base, may be made available in many cases for distinguishing species. In the present species and its nearest ally, F. incurvus, this character is efficient, since in the latter a spore equals one third the breadth of the peristomal tooth. In the F. obtusifolius, *Wils.*, the spores are unusually large, one being more than sufficient to cover the breadth of a tooth.

Tab. II. *A.* — *Fig.* 1. Plants of the natural size. *Figs.* 2, 4. Capsules. *Fig.* 3. Calyptra. *Fig.* 5. Female plant. *Fig.* 6. Male plant. *Fig.* 7. Antheridia. *Fig.* 8. A leaf. *Figs.* 9, 10. Portions of a leaf. *Fig.* 11. Portion of the peristome. *Fig.* 12. Spores. All except Fig. 1 more or less magnified.

3. FISSIDENS EXIGUUS, *Sulliv. Musc. Alleghan. n.* 182.

F. annuus, dioicus; caule simplici; foliis 5–9-jugis oblongo-lanceolatis immarginatis integerrimis, costa sub apice dissoluta; capsula terminali subobliqua vel erecta; operculo conico-rostellato; calyptra cuculliformi; flore masculo terminali.

Species præcedente dimidio major, folia minus elongata immarginata, capsula sæpius inæqualis subobliqua, sporæ minores.

It grows with the preceding species, and fruits at the same time.

TAB. II. *B.* — *Fig.* 1. Plants of the natural size. *Fig.* 2. Point of the leaf. *Figs.* 3, 6. Capsules. *Fig.* 4. Calyptra. *Fig.* 5. Female plant. *Fig.* 7. A leaf. *Fig.* 8. Antheridia. *Fig.* 9. Male plant. *Fig.* 10. Sections of leaves. *Fig.* 11. Spores. All magnified.

4. SCHISTIDIUM SERRATUM, *Hook. & Wils. in Drum. Musc. Amer. n.* 20. — *Musc. Alleghan. n.* 198.

This plant may be regarded as a highly developed state of the European Phascum patens; from which it is distinguished mainly by the firmer texture of the outer thecal membrane, and by a reduced form of opercular dehiscence. Its globose capsule separates at maturity into two equal portions by a circumscissile line, of which no traces are visible during the early stages of the plant, and no alteration, other than a slight discoloring of the cells near the line of separation, takes place; thus exhibiting an imperfect form of dehiscence in a moss of the operculate division.

The accordance of this plant with Phascum patens appears to be complete in all other important respects.

It may be here noticed, that the position and structure of the male flower of P. patens has been incorrectly described and figured by authors as terminal, and borne upon proper branches arising from the base of the main stem. Such is by no means the case. The male flower, as in Schistidium serratum, is situated near the female, rarely mixed with it, in the axils of the floral or upper leaves, either of the main stem or its innovations; the antheridia, 3–5 in number, are accompanied by paraphyses with globose terminal cells; and rudimentary perigonial leaves are occasionally present. All the North American specimens of P. patens, so called, that have come under my observation, belong to immature states of Schistidium serratum; but future examination may show that the two plants are less distinct than is at present supposed.

Our plant, as now understood, cannot be referred to the genus Schistidium of Bridel, much less to that of Bruch & Schimper; nor does it agree with any other well defined genus. With Physcomitrium, *Br. & Sch.*, it has many characters in common, and, in fact, the position of the male flower presents the only essential point of disagreement.

The plant is annual, and is often met with in the Middle and Western States, on rich soil, particularly near the margins of streams subject to inundation; it fruits during the summer and autumnal months.

TAB. II. *C.* — *Fig.* 1. Plants of the natural size. *Fig.* 2. Part of a plant, showing the capsule, operculum, and the position of the male flowers. *Fig.* 3. Spores. *Fig.* 4. Calyptra. *Fig.* 5. Antheridia with paraphyses. *Fig.* 6. Plant with a simple stem. *Fig.* 7. A portion of leaf. *Fig.* 8. A plant with innovations. All magnified.

5. MARCHANTIA DISJUNCTA, *Sulliv. Musc. Alleghan. n.* 286.

M. dioica; receptaculo fœmineo excentrico subseptem-radiato, radiis apice cuneato-dilatatis emarginato-crenulatis subtus dense barbatis; involucro 1–3-carpo subintegerrimo; receptaculo masculo semicirculari 7-radiato, radiis usque ad brevem pedunculum discretis; fronde dichotoma et articulatim innovante: cætera *M. polymorphæ.*

This, the second species of the genus known to the flora of the United States, differs strikingly from all others in its male receptacle. It has nowhere been found except on the high banks of the Alabama river, near the town of Claiborne, where I met with it in May, 1845.

Tab. III. — *Fig.* 1. Female plant, natural size. *Fig.* 2. Male plant, natural size. *Fig.* 3. Male receptacle, with a portion of the frond. *Fig.* 4. Transverse section of a ray of the male receptacle. *Fig.* 5. A gemmiferous cup. *Fig.* 6. Portion from the margin of the same. *Fig.* 7. Gemmæ. *Fig.* 8. Female receptacles. *Fig.* 9. Perpendicular sections of the same. *Fig.* 10. Perianth and calyptra. *Fig.* 11. A young pistil. *Fig.* 12. Chaffy scales of the receptacle. *Fig.* 13. Transverse section of the peduncle. *Fig.* 14. Spores and an elater. *Fig.* 15. Portion of a radicle. All the analyses are more or less magnified.

6. ANEURA SESSILIS, *Musc. Alleghan. n.* 280.

Jungermannia sessilis, *Spreng.* — *Lehm. Pugill.* 4, *p.* 34. — *Hook. & Wils. in Drumm. Musc. Amer. n.* 174.

The notices heretofore taken of this species appear to have been drawn from imperfect specimens of the female plant. Aneura ses-

silis is dicœcious, with the antheridia embedded in the upper and concave surface of elongated tapering and deflexed processes, which, in clusters of 2–4 together, proceed from the margin of the frond. The capsule, in its normal state, is borne upon a long exserted pedicel; and even in cases where the capsule is apparently sessile (whence the specific name), the pedicel is of the usual length, but is folded up within the calyptra, whose thick substance resists its protrusion.

This species belongs to the Southern States; it fruits copiously in the cypress swamps around New Orleans, always growing on decayed logs. It is occasionally found as far north as in central Ohio, where, however, it requires artificial protection to mature its fruit.

TAB. V. — *Fig.* 1. Female plant, natural size. *Fig.* 2. Male plant, natural size. *Fig.* 3. Portion of a frond, with marginal processes or male receptacles. *Figs.* 4, 5, 6. Male receptacles. *Fig.* 7. Portion of a frond, with calyptra, pedicel, and capsule. *Fig.* 8. Young fruit. *Fig.* 9. Transverse section of a calyptra. *Fig.* 10. Upper part of a calyptra. *Fig.* 11. Valves of the capsule in a dry state. *Fig.* 12. The same in a moist state. *Fig.* 13. Upper part of a valve of the capsule. *Fig.* 14. Elaters and spores. *Fig.* 15. Portion of a valve of the capsule. *Fig.* 16. Transverse section of the same. *Fig.* 17. Transverse section of the frond. The analyses are more or less highly magnified.

7. AMONG the most remarkable of North American Hepaticæ is one found near Salem, in North Carolina, by the late Mr. Schweinitz, which he made known in his *Specim. Fl. Amer. Sept. Crypt.* (1821), under the name of *Targionia orbicularis.* Subsequently, he proposed to establish for it his new genus *Carpobolus*, of which he gave a detailed description and figure in the *Journ. Acad. Nat. Sci. Philad.* (1822).

Since the discovery, in Ohio, of two other plants, congeners with that of Mr. Schweinitz, it became necessary to reform the generic characters. The generic name has also been changed to *Notothylas*; the name of Carpobolus having been previously applied to a genus of Fungi, which is still retained by some authors; furthermore, its etymology conveys an idea inapplicable to these plants.

The genus and its species are thus characterized in the *Musci Alleghanienses*: —

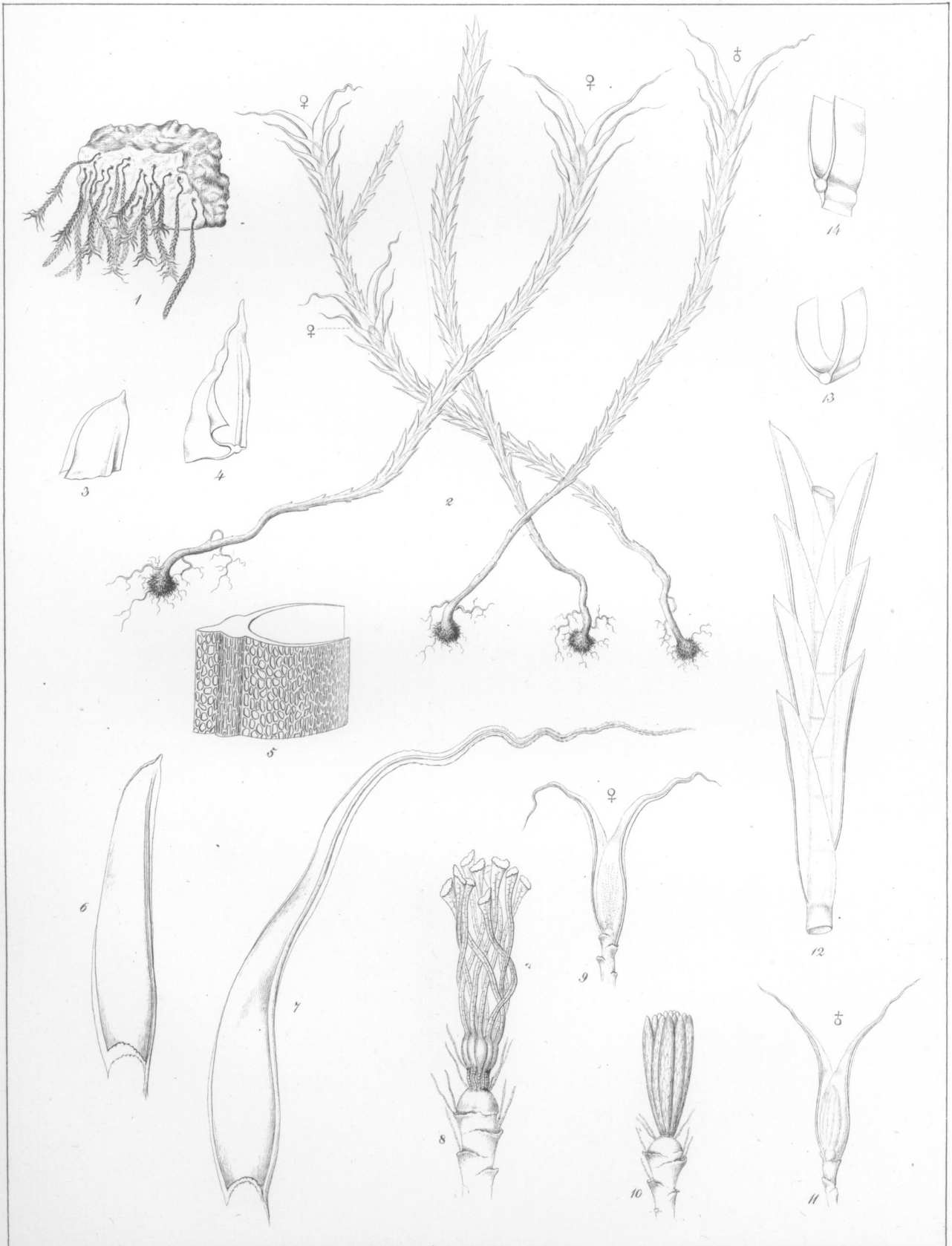
NOTOTHYLAS, *Sulliv. Musc. Alleghan. n.* 289, 290.

Carpobulus, *Schweinitz, in Journ. Acad. Nat. Sci. Philad.* 2, *p.* 336. (1822).
Targioniæ spec., *Schweinitz, Specim. Fl. Amer. Sept. Crypt. p.* 23. (1821). — *N. ab E., Europ. Leberm.* 4, *p.* 317.

Monoica. Fructus dorsales, sparsi. Involucrum sessile, frondi continuum, initio clausum, tandem superne fatiscens. Perianthium nullum. Calyptra . . . . . Capsula involucro inclusa, oblongo-sphæroidea, compressa vel ovato-cylindrica, brevissime pedicellata, pedicello in bulbo incrassato affixo, sutura longitudinali ab apice ad medium subbivalvatim, vel sutura deficiente frustulatim, dehiscens. Columella linearis. Sporæ quaternatim aggregatæ, subglobosæ, læviusculæ. Antheridia frondi immersa, elliptico-globosa. Frons orbicularis, laciniata, tenera, papuloso-reticulata, margine undulato-crispa, subtus radiculosa, massis granulatis hic illic immersis.

Plantæ annuæ, terrestres, limicolæ, in umbrosis Ohionis, Carolinæque Septentrionalis observatæ.

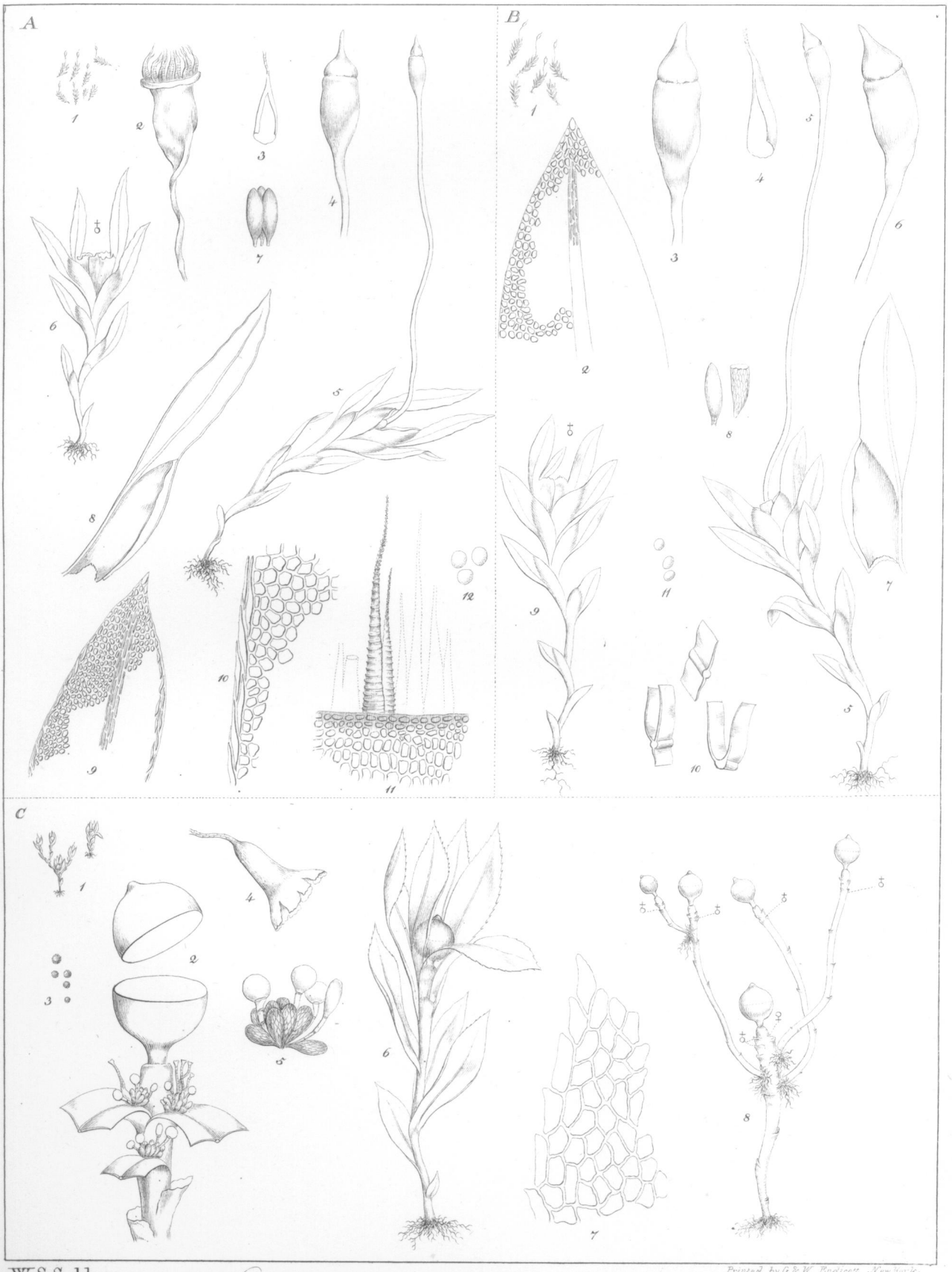
1. N. ORBICULARIS, *Sulliv.* (Carpobolus orbicularis, *Schweinitz, l. c.*) involucro suberecto; capsula oblongo-ellipsoidea compressa cum vel absque sutura concolori: cætera ut in *N. valvata.*



W. S. S. del.

J. Brestele sc.

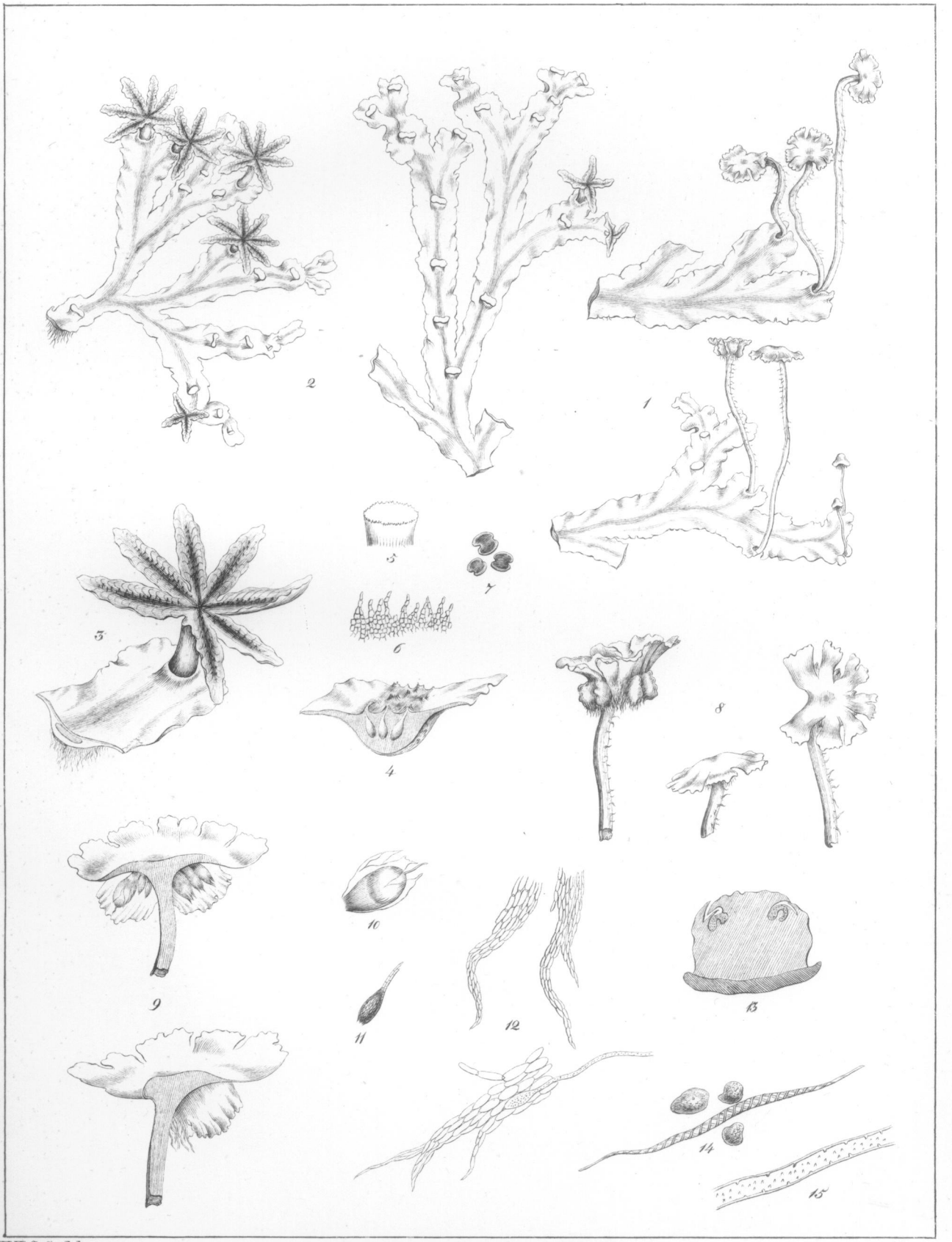
Phyllogonium Norvegicum.



W. S. S. del.

Printed by G. & W. Endicott, New York.

A. Fissidens minutulus, B F. exiguus.
C Schistidium serratum.

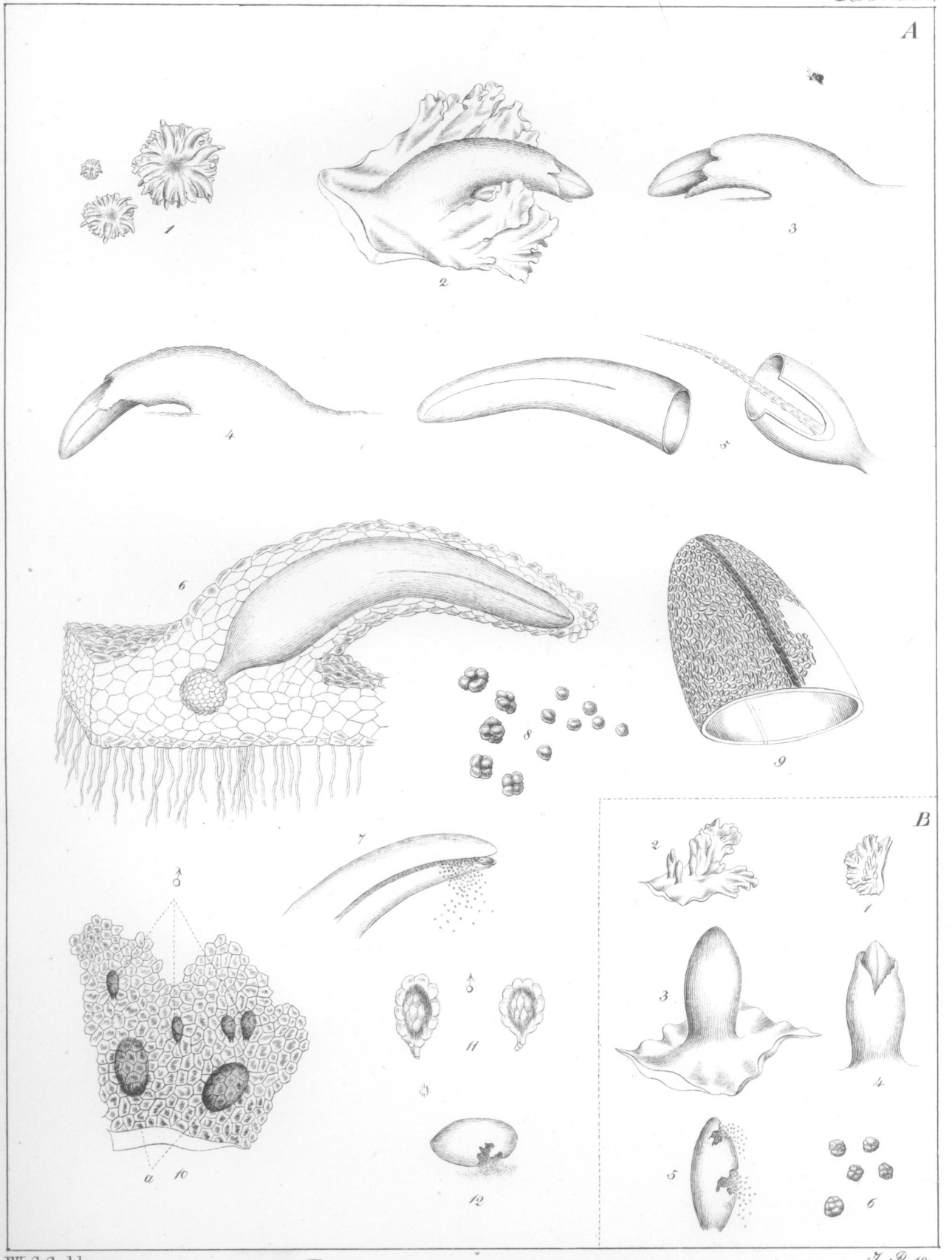


W. S. S. del.

Printed by G & W. Endicott N.Y.

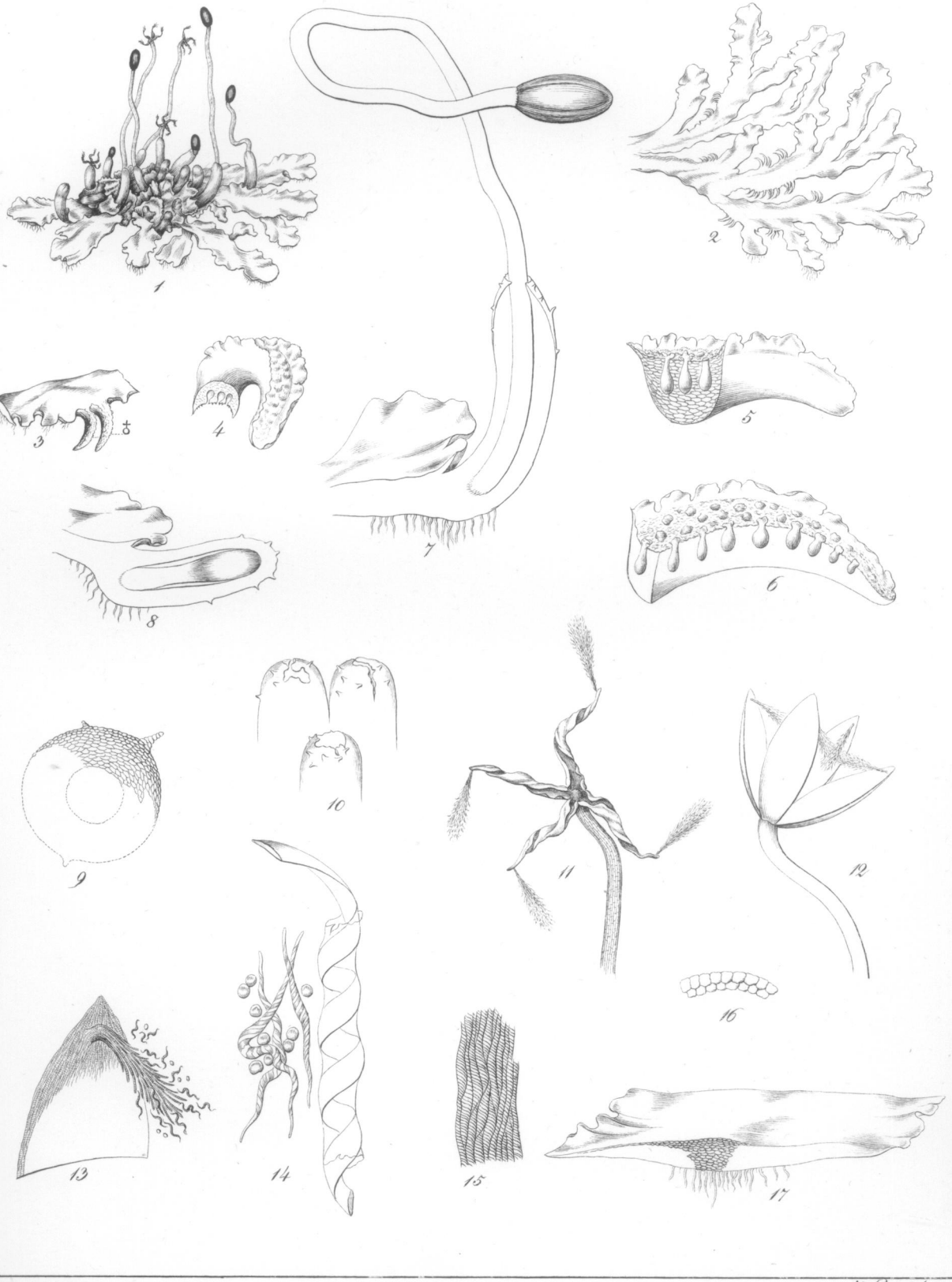
J. P. sc.

Marchantia disjuncta.



W. S. S. del. J. P. sc.

A *Notothylas valvata*, B *orbicularis*.



W. S. S. del.

J. Prestele sc.

Aneura sessilis.

Diagnosis secundum specimina *Schweinitziana* in Herb. *Acad. Nat. Sci. Philad.*

HAB. In Carolina Superiore prope Salem.

2. N. VALVATA, *Sulliv.*: fronde diametro tri-octolineari; involucro horizontali deflexo corniformi; capsula elongato-cylindrica curvula sutura colorata semper instructa; sporis luteolis subfuscisve.

HAB. In humidiusculis circa Columbus Ohionis, sat frequens. — Maturescit Æstate-Autumno.

3. N. MELANOSPORA, *Sulliv.*: capsula sutura omnino nulla; columella appendiculata; sporis atrofuscis dimidio majoribus quam in præcedente: cætera conveniunt.

HAB. In iisdem locis cum priore; rarissima.

We have here a genus that cannot be placed in any of the tribes of Hepaticæ as now circumscribed. Its station is between Anthoceroteæ and Ricciеæ. The frond is undistinguishable from that of Anthoceros, to which genus it also approaches in its tendency to bivalve dehiscence, in the presence of a columella, and in the manner of ripening the spores, which commences at the apex of the capsule and proceeds towards its base, so as to present spores in all stages of development. A relationship to Riccia is shown by the inclosure of the subsessile capsule in the frond, or rather in a protruded portion of it, as also by its embedded anthers, and the absence of any thing like elaters. Unlike both of the above genera, the calyptra, if present at all, vanishes at an extremely early stage of the plant's growth; for, in many dissections of N. valvata and N. melanospora, at all periods of growth, I have never seen a calyptra. The only

indication of its existence is the bulb at the base of the capsule, which may be the rudiment of that organ. Mr. Schweinitz appears to have detected no calyptra, and my examination of authentic specimens of the same species gave a similar result. I was, however, able to verify the presence of the columella pointed out by him in his first notice of the Southern species, but which, in his second and more extended account, is not referred to. With regard to the three species here given, it can hardly be questioned that N. orbicularis is distinct from the Ohio species; but that the two plants are equally distinct from each other is not so entirely free from doubt. Still, the specific characters assigned them have thus far proved constant. What phases other localities may produce remain to be seen; for the present (with Nees), "malo peccare in discriminandis quam in confundendis rerum naturæ cognitionibus."

TAB. IV. *A. N. valvata.* — *Fig.* 1. Plants of the natural size. *Fig.* 2. Portion of the frond, with an involucre and capsule. *Figs.* 3, 4. Involucres and capsules. *Fig.* 5. A capsule dissected, showing the columella. *Fig.* 6. Vertical section of an involucre and a portion of the frond, exposing the capsule. *Fig.* 7. A capsule dehiscing by its suture. *Fig.* 8. Spores. *Fig.* 9. Upper part of a capsule, showing the line of dehiscence and reticulation. *Fig.* 10. Portion of a frond, showing the imbedded anthers and masses of granules. *Fig.* 11. Antheridia. *Fig.* 12. Mass of granules. All magnified.

B. N. orbicularis. — *Fig.* 1. Plant of the natural size. *Figs.* 2, 3. A portion of the frond, with fruit. *Fig.* 4. Involucre and capsule. *Fig.* 5. Capsule bursting irregularly. *Fig.* 6. Spores. The analyses all magnified.

COLUMBUS, OHIO, *June*, 1846.